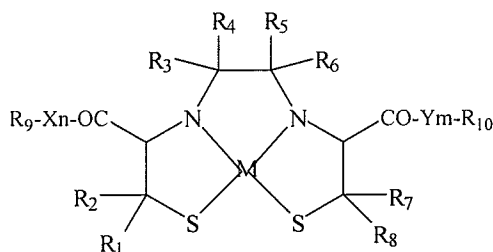


## I. AMENDMENT OF THE CLAIMS

The following listing of claims will replace all prior versions and listings of the claims in the application:

### Listing of the Claims:

1. (Canceled)
2. (Previously Presented) A compound that comprises an  $N_2S_2$  chelate conjugated to a targeting ligand of formula:



wherein

$R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$  and  $R_8$  are independently H or  $CH_3$ ;

$R_9$  and  $R_{10}$  are independently H,  $CH_3$ , OH, aminopenciclovir, adenosine, FIAU, FIRU, IVFRU, GCV, PCV, FGCV, FPCV, FHPG, FHBG, guanine, a COX-2 inhibitor, an anti-EGF receptor, hereceptin, angiostatin, thalidomide, amifostine, fullerene, lactose, luteinizing hormone, pyridoxal, quinazoline, transferrin, or trimethyl lysine;

provided that at least one of  $R_9$  and  $R_{10}$  are aminopenciclovir, adenosine, FIAU, FIRU, IVFRU, GCV, PCV, FGCV, FPCV, FHPG, FHBG, guanine, a COX-2 inhibitor, an anti-EGF receptor,

herceptin, angiostatin, thalidomide, amifostine, fullerene, lactose, leuteinizing hormone, pyridoxal, quinazoline, transferrin, or trimethyl lysine;

n is 0 or 1;

m is 0 or 1;

X is a water soluble peptide, C<sub>1</sub>-C<sub>20</sub> alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine when n is 1, or a bond when n is 0;

Y is a water soluble peptide, C<sub>1</sub>-C<sub>20</sub> alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine when m is 1, or a bond when m is 0; and

M is <sup>99m</sup>Tc (oxotechnetium), <sup>188</sup>Re, <sup>186</sup>Re, <sup>183</sup>Sm, <sup>166</sup>Ho, <sup>90</sup>Y, <sup>89</sup>Sr, <sup>67</sup>Ga, <sup>68</sup>Ga, <sup>111</sup>In, <sup>183</sup>Gd, <sup>59</sup>Fe, <sup>225</sup>Ac, <sup>212</sup>Bi, <sup>211</sup>At, <sup>45</sup>Ti, <sup>60</sup>Cu, <sup>61</sup>Cu, <sup>67</sup>Cu, <sup>64</sup>Cu or <sup>62</sup>Cu.

3-4. (Canceled)

5. (Withdrawn) The compound of claim 2, wherein the COX-2 inhibitor is celecoxib, rofecoxib, or etoricoxib.

6-13. (Canceled)

14. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises carnitine or doxorubicin.

15. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises guanine or adenosine.

16. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises amifostine.

17. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises an anti-EGF receptor.

18-22. (Canceled)

23. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises fullerene.

24. (Canceled)

25. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises lactose.

26. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises pyridoxal.

27. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises quinazoline.

28. (Withdrawn) The compound of claim 2, wherein the targeting ligand comprises trimethyl lysine.

29-30. (Canceled)

31. (Previously Presented) The compound of claim 2, wherein the N<sub>2</sub>S<sub>2</sub> chelate is further defined as ethylenedicysteine.
32. (Previously Presented) The compound of claim 2, further comprising a radioactive nuclide.
33. (Original) The compound of claim 32, wherein the radioactive nuclide comprises <sup>99m</sup>Tc, <sup>188</sup>Re, <sup>186</sup>Re, <sup>183</sup>Sm, <sup>166</sup>Ho, <sup>90</sup>Y, <sup>89</sup>Sr, <sup>67</sup>Ga, <sup>68</sup>Ga, <sup>111</sup>In, <sup>183</sup>Gd, <sup>59</sup>Fe, <sup>225</sup>Ac, <sup>212</sup>Bi, <sup>211</sup>At, <sup>45</sup>Ti, <sup>60</sup>Cu, <sup>61</sup>Cu, <sup>67</sup>Cu, <sup>64</sup>Cu or <sup>62</sup>Cu.
34. (Withdrawn) The compound of claim 2, further comprising a water soluble peptide, C<sub>1</sub>-C<sub>20</sub> alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine positioned between the targeting ligand and the chelate.
35. (Previously Presented) A method of synthesizing a radiolabeled N<sub>2</sub>S<sub>2</sub> chelate conjugated to targeting ligand comprising the steps:
- a) obtaining a compound in accordance with claim 2;
  - b) admixing said compound a radionuclide and a reducing agent to obtain a radionuclide labeled derivative, wherein the N<sub>2</sub>S<sub>2</sub> chelate forms a chelate with the radionuclide.
36. (Original) The method of claim 35, wherein said reducing agent is a dithionite ion, a stannous ion or a ferrous ion.
37. (Original) The method of claim 35, wherein said radionuclide is <sup>99m</sup>Tc, <sup>188</sup>Re, <sup>186</sup>Re, <sup>183</sup>Sm, <sup>166</sup>Ho, <sup>90</sup>Y, <sup>89</sup>Sr, <sup>67</sup>Ga, <sup>68</sup>Ga, <sup>111</sup>In, <sup>183</sup>Gd, <sup>59</sup>Fe, <sup>225</sup>Ac, <sup>212</sup>Bi, <sup>211</sup>At, <sup>45</sup>Ti, <sup>60</sup>Cu, <sup>61</sup>Cu, <sup>67</sup>Cu,

$^{64}\text{Cu}$  or  $^{62}\text{Cu}$ .

38. (Original) A method of imaging a site within a mammalian body comprising the steps:
- a) administering an effective diagnostic amount of a compound in accordance with claim 32 to said site; and
  - b) detecting a radioactive signal from said compound localized at a site.
39. (Original) The method of claim 38, wherein said site is a tumor.
40. (Original) The method of claim 38, wherein said site is an infection.
41. (Original) The method of claim 38 wherein said site is breast cancer, ovarian cancer, prostate cancer, endometrium, heart cancer, lung cancer, brain cancer, liver cancer, folate (+) cancer, ER (+) cancer, spleen cancer, pancreas cancer, or intestine cancer.
42. (Previously Presented) A kit for preparing a radiopharmaceutical preparation comprising:
- a) a sealed container including a predetermined quantity of a compound that is a  $\text{N}_2\text{S}_2$  chelate-targeting ligand conjugate in accordance with claim 2; and
  - b) a sufficient amount of a reducing agent.

43. (Original) The kit of claim 42, further comprising a radionuclide.
44. (Original) The kit of claim 43, wherein the radionuclide is  $^{99m}\text{Tc}$ ,  $^{188}\text{Re}$ ,  $^{186}\text{Re}$ ,  $^{183}\text{Sm}$ ,  $^{166}\text{Ho}$ ,  $^{90}\text{Y}$ ,  $^{89}\text{Sr}$ ,  $^{67}\text{Ga}$ ,  $^{68}\text{Ga}$ ,  $^{111}\text{In}$ ,  $^{183}\text{Gd}$ ,  $^{59}\text{Fe}$ ,  $^{225}\text{Ac}$ ,  $^{212}\text{Bi}$ ,  $^{211}\text{At}$ ,  $^{45}\text{Ti}$ ,  $^{60}\text{Cu}$ ,  $^{61}\text{Cu}$ ,  $^{67}\text{Cu}$ ,  $^{64}\text{Cu}$  or  $^{62}\text{Cu}$ .
45. (Original) The kit of claim 42, further comprising an antioxidant.
46. (Original) The kit of claim 45, wherein the antioxidant is vitamin C, tocopherol, pyridoxine, thiamine, or rutin.
47. (Original) The kit of claim 46, wherein the antioxidant is vitamin C.
48. (Original) The kit of claim 42, further comprising a transition chelator.
49. (Original) The kit of claim 48, wherein the transition chelator is glucoheptonate, gluconate, glucarate, citrate, or tartarate.
50. (Original) The kit of claim 49, wherein the transition chelator is gluconate or glucarate.
51. (Original) The kit of claim 42, wherein the reducing agent is tin (II) chloride or triphenylphosphine.
- 52-59. (Canceled)
60. (Previously Presented) The compound of claim 2, wherein  $\text{R}_9$  is adenosine, aminopenciclovir, FIAU, FIRU, IVFRU, GCV, PCV, FGCV, FPCV, FHPG, FHBG, or guanine.

61. (Previously Presented) The compound of claim 60, wherein R<sub>9</sub> is aminopenciclovir.